

Chem 155 Homework #6 Due at the start of class on Weds. Feb 20.

Reading: Chapter 15

Chapter 14 Problems:

14.38

14.68

Additional Problems:

- 1) a) What is the energy in J of a 635 nm photon. b) How many photons per second are emitted by a 1 mW laser pointer with a 635 nm wavelength? c) What color is this laser pointer?
- 2) Calculate the potential energy in J, of an electron and a proton separated by 1 Angstrom. What is this value in eV?
- 3) If an electron has 100 eV of kinetic energy how fast is it moving in m/s? What is its momentum?
- 4) Suppose that a 100W source radiates 600 nm light uniformly in all directions. Assuming that the human eye can detect this light if only 20 photons per second enter a dark-adapted eye with a 7-mm diameter pupil. How far from the source can the light be detected under these conditions? Why do you think can't we see this far in the "real world"?
- 5) In the Bohr model of the atom, electrons are constantly accelerating, yet they are traveling at constant speed. Explain.

Chapter 15 Problems:

15.4

15.8

15.14

15.23

15.24

15.28

15.68